

The Space Environment Sensor Suite for NPOESS

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Abstract.

The National Polar-orbiting Operational Environmental Satellite System (NPOESS) is the next generation polar environmental satellite and will transition from the current Defense Meteorological Satellite Program (DMSP) and Polar Operational Environment Satellite (POES) program in the latter part of this decade. The Space Environment Sensor Suite (SESS) is one of the major payloads currently under development within the NPOESS program. SESS is a set of instruments that takes measurements to produce 11 NPOESS Environmental Data Records (EDRs). These data products describe the space environment in terms of particles, fields, aurora, and the ionosphere. NPOESS is a key component of the future U.S. space weather monitoring architecture and these EDRs are responsive to the national space weather needs from which requirements for the NPOESS space environmental data records were derived. The NPOESS requirements for space environmental data are specified in the Integrated Operational Requirements Document (IORD) jointly approved by the DOC, the DoD, and the National Aeronautics and Space Administration (NASA). The SESS instrumentation has a strong heritage in the space environmental sensors that are currently deployed on DMSP and POES. However, the challenges offered by the NPOESS mission specifications have necessitated upgrades to the heritage designs. In addition, the advanced capabilities for the NPOESS will provide operational Space Weather users with significantly increased data volume and reduced data latency over that which is presently available. The SESS EDRs are allocated to Particles & Fields instruments and Optical instruments that are distributed on the three-orbit NPOESS system architecture to satisfy the user community's performance and coverage needs. This paper presents details on the SESS sensors, the SESS architecture and its expected performance, and the SESS launch schedule.